National Institute of Environmental Health Sciences

Grass pollen allergens globally: The contribution of subtropical grasses to burden of allergic respiratory diseases

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Abstract:

Grass pollens of the temperate (Pooideae) subfamily and subtropical subfamilies of grasses are major aeroallergen sources worldwide. The subtropical Chloridoideae (e.g. Cynodon dactylon; Bermuda grass) and Panicoideae (e.g. Paspalum notatum; Bahia grass) species are abundant in parts of Africa, India, Asia, Australia and the Americas, where a large and increasing proportion of the world's population abide. These grasses are phylogenetically and ecologically distinct from temperate grasses. With the advent of global warming, it is conceivable that the geographic distribution of subtropical grasses and the contribution of their pollen to the burden of allergic rhinitis and asthma will increase. This review aims to provide a comprehensive synthesis of the current global knowledge of (i) regional variation in allergic sensitivity to subtropical grass pollens, (ii) molecular allergenic components of subtropical grass pollens and (iii) allergic responses to subtropical grass pollen allergens in relevant populations. Patients from subtropical regions of the world show higher allergic sensitivity to grass pollens of Chloridoideae and Panicoideae grasses, than to temperate grass pollens. The group 1 allergens are amongst the allergen components of subtropical grass pollens, but the group 5 allergens, by which temperate grass pollen extracts are standardized for allergen content, appear to be absent from both subfamilies of subtropical grasses. Whilst there are shared allergenic components and antigenic determinants, there are additional clinically relevant subfamily-specific differences, at T- and B-cell levels, between pollen allergens of subtropical and temperate grasses. Differential immune recognition of subtropical grass pollens is likely to impact upon the efficacy of allergen immunotherapy of patients who are primarily sensitized to subtropical grass pollens. The literature reviewed herein highlights the clinical need to standardize allergen preparations for both types of subtropical grass pollens to achieve optimal diagnosis and treatment of patients with allergic respiratory disease in subtropical regions of the world.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Ecosystem Changes

Air Pollution: Allergens

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Asthma, Upper Respiratory Allergy

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified